

Policy Alternative to solve Problems and Issues for the u-City Implementation in Korea

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Abstract—A u-City has been adopted since 2005. In the beginning, the concept of u-City was improving life quality and revitalizing related industries with Information Technology into the city construction and promoting it as national export model business. But, as years go by, it has been changed and appeals to the sensitivity and warm-hearted. Latest key-word of u-City is embodying clean, safe, convenience and healthy city through ubiquitous IT. Now, u-City project which requires a huge budget and resources is not only the domestic issue and it has been spreading all over the world. Problems and obstacles have been founded while promoting the u-City project. Mutual implementation, standardization, information protection and security, preparing the budget, duplication of tasks between government bodies, competition structure, terminal compatibility, problems on the law and system have been raised. In this study, problems and issues are listed and also an alternative political proposal to solve the problems and issues will be brought up.

Keyword—e-Government, Smart City, ubiquitous, ubiquitous City, u-City, u-Government

I. INTRODUCTION

Korea's IT industry growth has somewhat stalled in recent years. Thus, It is a very urgent situation to vitalize the national nature of the IT industry and to find a New Brand Industry which can be followed by high speed Internet and mobile devices.

We have been innovated the global IT industry that was towing the national economy during the past 10 years. Above all, it is time to lay the groundwork necessary for this point and to foster new industries as a growing new IT paradigm to feed our economy over the next 20 years.

Recently a lot of interest and expectations about u-city topic for local governments also can be understood in the context of our IT industry faced several issues to resolve evolutionary.

In other words, to fuse and converge on a particular space with variety of IT technologies and infrastructures such as RFID / USN, ITS, and WiBro has evolved since 2003 by category, it is

u-City: A ubiquitous City is a city or region with ubiquitous information technology. The concept has received most attention in South Korea, which is planning to build some 15 ubiquitous cities. The first u-City, Hwasung-Dongtan, has been partially completed and operated in 2007. It characterized the diverse u-Services that include u-Traffic, u-Parking, and u-Crime Prevention service. The largest of u-City is Songdo is scheduled to open in 2014.

considered a new attempts were being represented by keyword to maximize the synergy among infrastructure, technology and service as individual element.

The term for u-City was created by experts group in 2005. After that it has been formulated through the various forums, seminars, workshops. Specific effort to build a u-City is the pilot and demonstration projects over the years to explore the feasibility and visibility of the business. These projects are still the pilot project level and the budget is small yet, but our vision and goal was determined, and a sense of confidence was gained a little.

But as the concept of u-City is so large and it needs the enormous finance and various technologies in order to realize u-City, the various problems and difficulties have occurred in actual propulsion.

This paper lists these issues and provides the policy alternatives to solve these problems.

II. PROGRESS AND CURRENT STATUS

A. u-City of Gestation

The government has established u-City policies for the urban and architectural area by applying the convergence technology and service since 2003. As u-City is one of IT839 strategy, it was a plan to verify an attempt to create a next generation of the new growth engines of the IT sector

At the time, the NIA(National Information Society Agency) which was one of affiliate agency of MIC(Ministry of Information and Communication) was responsible and played the leading role to establish a "u-City Forum". Industry, academia, professionals and local governments and urban development actors broadly to participate the U-City Forum in order to setup a chapter of private-public opinion for u-City concept in May 2005.

MOCT(Ministry of Construction and Transportation) had been also planning a policy as the world's first implementation of "IT based City" on a ubiquitous space to reflect the trend of convergence technology and to accommodate the new IT technologies into the construction sector.

In October 2005, MIC and MOCT jointly introduced the 'Promotion Strategy of the basis for the u-City Implementation' and created the 'u-City Promotion Council' that was chaired by

Assistant Secretary as a u-City-based propulsion system when the 'Economic Policy Coordination Meeting' was opened. In February 2006, u-City Construction Co-operation Agreement (MoU) was signed between the ministries. MIC was responsible for u-IT area, MOCT was in charge of the urban development area. So, the role of inter-agency was established and government-wide u-City propulsion system was fixed finally.

MIC confirmed the Basic Plan of Activating Promotion for u-City in December 2006 and had been conducted specifically pilot projects for each local government since 2007.

MOCT also launched the 'u-Eco City Business Promotion Group' in August 2007 and MOCT was laying the platform for building u-City by passing the 'Ubiquitous city Planning and Construction of the Act' at a Cabinet meeting in December 2007.

According to the government's 'First ubiquitous City Comprehensive Plan' containing 4 grand strategies, 22 detailed tasks published in November 2009, u-City construction was being pursued for three reasons:

First, the problem occurred due to urbanization. Second, the usefulness of the world's leading information and communications technology. Third, the needs to create a city of the future.

In the comprehensive plan ubiquitous city be pursued until 2013, Government-wide promotion strategy for the systematic development of the u-City was embedded to solve urban problems such as traffic, environment, and to increase the city's competitiveness through the convergence of construction and IT.

Through this, it expected to reach about 1 trillion won of the domestic output value, \$2,160 billion of the global market size and 63,000 people of domestic job creation.

According to the statistics of the national research institute ETRI, 20 trillion won will be invested on "u-City projects" from local governments, public sector by 2015. ETRI was expected to the Industrial Production Inducement Effect will be approximately 58 trillion won, the Industrial Value-added Inducement Effect will be approximately 44 trillion won.

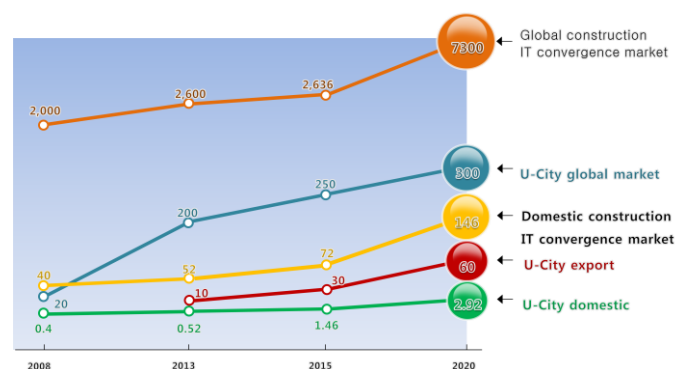


Fig 1. Market size of u-City

'The u-eco City Business Center' and 'Advanced Technology Development Center for Intelligent Construction & IT Convergence' at KAIST are released the domestic market size of u-City is 1.46/2.92 trillion and global market size of u-City is expected to 250/300 trillion in 2015/2020,

B. Current Status

Korea's u-City has been promoted with one concept for the city. System Integration Companies such as KT, Samsung SDS had installed the ubiquitous infrastructure on work area or living environment for the convenience in their premises - apartment, district. Recently, u-City projects are being promoted widely by the central government as well as local governments, urban developers and construction operators.

According to data provided by the MLTMA, we can see that a third of the domestic cities is ongoing to the u-City project.

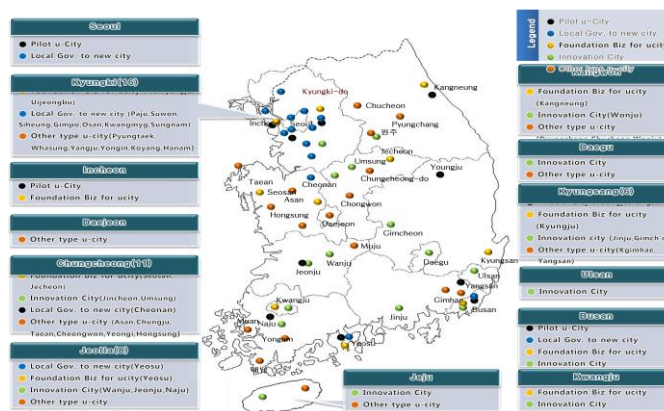


Fig 2. Current status of u-City projects

Case practices listed below as "Sangam DMC in Seoul", "u-Gangnam, Gangnam-gu Office in Seoul", "u-Busan in Busan", "u-Songdo in Incheon", "u-Daejeon in Daejeon", "u-Gwangju in Gwangju", "u-Daegu in Daegu," "u-Jeju in Jeju Island", "u-Jeonju, in Jeonju", "u-Chonnam in Jeollanam-do Province", "Digital city in Yongin, Heungdeok", "u-City in Dongtan", "u-Paju in Paju", "u-Suwon in Suwon", "u-Pangyo in Gyeonggi-do Province", "u-Gyeongbuk in Gyeongsangbuk-do Province", "u-Changwon in Changwon", "u-Ohsung in Chungcheongbuk-do Province", "u-Asan, in Chungcheongnam-do Province", and so on.

The u-City project by local government was a tendency to promote a specific task to link industrial development strategies and socio-cultural characteristics of each region as well as for reliable and convenient residential environment.

The u-City of central government was started with establishing the plan of u-Korea Vision Strategy and the u-City Activate Plan of MIC. MOHA (Ministry of Government Administration and Home Affairs) in charge of e-government presented 3 development stages and 5 implementation strategies for the promotion of e-government as part of the next generation of future e-government business.

MLTMA(Ministry of Land, Transport and Maritime Affairs) has taken to pursuing the business of "Intelligent Technology Innovation Program of the National Land Information" as one of the NGIS(National Geographic Information System) projects. It was linked with a GIS technology and state-of-the-art IT technology plan to build a basic digital national and space.

In 2008, "u-City Construction Assistance Act" was enacted to

establish procedures of the u-City construction projects and to solve the problem from the individual u-City construction.

So far, The proposed service models were the Based Service such as transportation, environment, facilities, and crime / disaster prevention, disaster, a comprehensive civil services as well as the Public Service such as administrative support, social welfare, education, health / medical, cultural / tourism, urban space facilities management.

It was possible to ensure the City's brand value and to improve the quality of civic life by developing and providing the specialized value-added services to city or space.

In summary, the execution of u-City project by local governments mainly was a common factor for regional development.

Local governments were pursuing the benefits of living of city dwellers to build intelligent services about a variety of city activities such as transportation, environment, facilities management and urban safety management by using information technologies and ubiquitous IT technology.

Korea had already a world-class wired and wireless infrastructure environment and competitiveness in related industries such as the construction and civil engineering industry. Even more importantly, It was evaluated to be a high likelihood of success in terms of broad and high-level user-based.

In addition, the evolving tech of ubiquitous IT and the high demand of private made the u-City accelerated and activated through these.

C. Types and Models of u-City

u-City project can be distinguished between "Urban Type" focused on the whole city construction and "Town Type" for district area when were classified the u-City project by a project size, project target and project organization.

Urban type is often in case of the development project for the new and old city which is launched and ordered by mainly public agencies or municipalities. Town type is the development project for a complex of small and medium size by private enterprises.

In Urban type, there are two categories. One is the case of the existing city which has already passed the process of city-growth, but the ubiquitous technology is still required, the other is a new town that will be designed and promoted the new urban development projects completely.

The old city such as Busan, Gwangju, Jeonju is difficult to implement than the new city because it has already been developed on top of the existing urban infrastructure. There is no room to combine with u-IT technology. The example of new urban type is included Paju Unjeong City, Incheon Songdo City, Yongin Heungdeok.

Development of urban models are classified into five types that "residential city", "commercial city", "research of the city", "leisure/tourist city", "administrative city" in detail.

The residential city is a case of Seoul, South Jeolla Province, Yongin, Paju. The commercial city that has been applied in most metropolitan areas is also Seoul, Daegu, Busan, Incheon. Rresearch of the city is Gyeonggi-do including Seoul, surrounding Daejeon city. The leisure and tourism city is Busan, Gwangju, Jeju, Jeonju. Administrative city such as Seoul and

Suwon, and some cities was being defined.

Town type is provided the value-added services for specialized units of a particular small district. Services are mainly targeted to u-Home, u-healthcare, u-education at residential area and u-office, u-logistics/distribution at the commercial area. The projects such as Konkuk u-StarCity, Daejeon Future-X City and Cheongju Gwell City were the good examples in a few years ago.

It is a form of development projects being implemented by applying the ubiquitous IT technology for a variety of purposes on the complex buildings that are shops, offices, leisure, entertainment facilities, residential facilities and educational facilities.

Unlike public-oriented project of City Type, Town type project emphasizes civilian service or revenue model. Therefore it shall provide a personalized service to each customer from the perspective of a private development company, occupants and operating companies completely.

Sometimes, market forecasts can be quite difficult when the characteristics of business progression consider vary depending on several variables. However, in some cases, it might be possible explosive market compared to the urban project.

III. PROGRESS ON MAJOR ISSUES

The biggest complaint when the u-City projects were in progress was the ambiguity of u-City's concept including target and scope. In 2005, the concept of u-City was focused on enabling industry and creating jobs by introducing state-of-the-art IT technology on the existing old city.

IT839 Policy of MIC was set 1st phase as the target year of 2007 and had been recognized as a growth engine for incomes of \$ 20,000 to achieve. Some of the objection raised up against provider-oriented policy at that time, but the policy based on IT was larger proposition to focus on the entry of the advanced societies and to implement the world's best city.

Not only the development of the industry but the sustainable environment has put its focus on being comfortable and safe, and healthy cities and improving the quality of people's lives at the end of 2006.

The u-City has been applied to the various components of the IT infrastructure, technology, services, housing, economic, transportation, facilities, etc. and modified and supplemented a meaning of livable future environment-oriented urban ultimately.

The future policy of the u-City is being deployed as complementary while linking the u-City building direction of the municipalities, the government's revitalization plan and u-Eco city's planning and linkages of MCTL.

Until now, summarizing the u-City concept of each department of government, we ultimately enhance the quality of life of city dwellers while preserving the strengths of each city according to the characteristics through building the u-City that can be seen by implementing the healthy cities. U-City implies u-traffic, u-culture, u-tourism for the convenient city, u-crime, u-disaster, u-facilities management for the safe city and u-environment for a pleasant city by applying IT.

In preparation for a new government in 2013, ministries unified proposal is being prepared. It is the proper time to clear the problem that the disagreement or duplication of work between departments. No one knows yet, which department will be responsible for u-City policy when a new government launched. the obvious matter is that we must prepare the clear master plan include short-term and long-term plan, roadmap and legal and regime system maintenance.

By adding, to make these u-City propulsion policies specifically a more general and comprehensive, the current 'U-City Building Revitalization' plan should be modified and the specific government-wide level of project should be excavated to be able to achieve new goals and strategies

The problems highlighted several issues must need to solve and complement from u-City pilot projects until now promoted, USP(Ubiquitous Strategy Planning) and the standard guideline for u-City infrastructure.

To do this, ① u-services standard model and the technology development associated with interoperability ② implementing the infrastructure ③ funding and financial soundness ④ legal system maintenance, information security platform ⑤ establish a propulsion system including reestablishment of Ecosystem for the efficient u-City projects.

Successful Korean u-City model will be visible in the early four issues handled by in-depth.

Methodology and details which were derived the major issues on promoting are contained in the appendix presented. Jeongwoosu et al (2007) provides criteria for the selection of promising service by defining public services and private services. J.Y. Oh et al(2005) also suggested the topic of u-Service Current Status and Challenges of Citizens.

IV. ACTIVATION POLICY ALTERNATIVE OF U-CITY

A. Funding and Financial Soundness

Now, the u-City current status is still placed in a situation in a lack of financial resources due to the large investment and in insufficient fund creation. The difficulty of the u-City Promotion has been increased even if promoted as BTL or BOT, operators also is expected to take a return on investment in the long-term. Equivalent alternatives arrangements with promoting u-City are needed in order to enable corporate investment.

The funding plans have been taken so far, for example, through the reclamation and development of landfills at Incheon Songdo Free Economic Zone, Busan BEXCO. Unlike Saudi Arabia and Abu Dhabi that are uncontrollable oil dollars, Dubai has very little currency had a large amount of money spent over 1 trillion won, respectively, to build Burj Al Arab Hotel and Burj Dubai building. They had two buildings as a u-City model being sold at 3,000,000 won per square meter in spite of the sea and the sand desert. Through these, We found an interesting point that they earned more than 17 trillion won annually as real estate the proceeds from the sale. We might get answers here.

Another way of financing is to create revenue directly by operating the facilities of center such as Advertisement,

Experience House after a 'u-City integrated operating control center' was built. However, from the initial proposal, they had received a harsh rebuke from the National Assembly due to waste the invasion of privacy information, monitoring, un-necessary financial resources. Nevertheless, by changing more soften name from operations center to civil center, etc. recently, no longer there was no feeling a lot that citizens are being watched.

The end of 2006, Incheon Songdo suggested u-City Promotional Experience Center as an alternative. They had spent more than 100 billion to build this facility. But they had got an issue of enormous operating cost, they could not revive the advantages of operating.

In recent years, Local Governments own can be seen alternative plan that they are able to management, operating realistically to minimize the scale of the u-City Operations Center.

The services of crime prevention, policing progress had been individually before, operations are being deployed in the form of fund for new service comes across as existing budget because business combining IT technology has been integrated into the operations center even though services had dealt with separately.

The presence of a full-fledged operating center will be required when u-City has evolved into a large-scale urban form rather than a regional scale in the future. Indeed, a wide range of services and facilities are provided, publicity and profits may be sought.

The third alternative, by promoting the development of global enterprises and cooperative public-private partnership model, we can come up with the investment and operating costs of the u-City. This alternative is an attempt to attract foreign investment through the participation of foreign-invested companies for the implementation of sustainable u-City.

U-City at Songdo has been a smooth build after IFEZ, Incheon Urban Development Corporation, Cisco and Development Project Concessionaire were involved in the consortium by MoU.

B. Reestablishment of Ecosystem

The stake-holders of u-City Industry consists of telecommunication operators, urban development companies, SI vendors, government / local government and agencies such as the NLHC(National Land and Housing Corporation). There is a lot of the market strife between large companies and SMEs. It is the time the reestablishment of ecosystems is needed. Away from consumption and exclusive competition, the eco-systems are raising the u-City market pie and helping each other. The approach might be considered that the Town type of u-City is spread by SME, the Urban type of u-City is composed by Large enterprises. It needs to be applied the Consortium Forms to take the individual advantage of role sharing approach.

'U-City' Support Center under the NIA(National Information Society Agency in Korea) was installed in June 2006 to support u-City related to practical projects, Standardization and test-bed project management and the meeting of u-City policy community.

In 2008, MPAS(Ministry of Public Administration and Security), KCC(Korea Communications Commission),

MLTMA undertook the u-City projects after the MB government launched. But there were somewhat redundant elements by the same task on several ministries process.

A design of propulsion system for the promotion of systematic and step-by-step should have prepared, but it collapsed because the departments were not shuffled properly. More efficient and futuristic government-wide u-City was able to build through organic cooperation and the division of roles between the urban development officials.

As department shuffling can be not avoided when the new government will be start in 2013, the problems of lack of interoperability and connectivity among inter-agency should be solved at that point. A separated project by municipalities and the absence of standards of implementation technology and linkage service will not be allowed.

As well as relevant laws and regulations and departments are spread, it is essential to establish the institutional foundations of systematic government-wide u-City Promotion. Departmental organization problems can be solved easily when rather new regime changes.

However, we must be considered in the preparation of the government-wide "u-City Committee" can be deliberated ministries and local governments plan, comprehensive plan, major policy related u-City establishment. The work of local governments will be pursued separately anyway even if the u-City project of KCC, MLTMA, MOHA can be summarized in one

For organizational body below, "u-City practice consultation bodies" shall configure and operate to share the information, to promote u-City Policy and to discuss the urban infrastructure how to design / build. The subdivision composed of related experts worked in central government, local governments, public agencies.

In addition, active and systematic support is required to a successful overseas expansion of u-City model.

It should be presented alternative as a policy that is strategic international standardization of the standard model of u-City service may be created a leading overseas with research institutions and international cooperation and then the international seminar to exchange and spread of the national standard. Others are promotional activities, technology development and manpower efforts.

C. Implementing the u-City Infrastructure

On the infrastructure side, 'the u-City Infrastructure Comprehensive Guideline ' from u-City forum was helpful. Appropriate IT infrastructure in the u-City Plan should be reflected from urban development steps.

'Infrastructure Guidelines V1.0' published in 2008 was included the installation standards, guideline, recommendations for the CCTV, sensor nodes, RFID reader to get adequate information from u-City. The guidelines implied also the ways to efficiently build of u-City infrastructure to provide variety of u-services. The technologies of wireless base station, the foundation culverts, manholes, communication pavilion, fiber optic cable were adopted for the urban information collection and urban facility management.

In order to build a systematic u-City, a well-planned methodology would be introduced and applied. In other words,

the convergence procedural standard should be defined and step-by-step implementation should be performed through properly presented by 'the u-City construction guidelines and standards' for fusion of urban development and information technology.

First, the Urban Development Stage, urban infrastructure and IT industry convergence markets is formed.

Second, the Architectural Composition Stage, the cultivation of facilities and industrial relative buildings such as u-street, u-park, u-home, intelligent building, etc. are followed.

Third, the City Completed Stage, citizens target u-public, private services (u-traffic, u-education, u-healthcare, u-crime, u-education, etc.) will be provided finally.

To do this, creating the infrastructure in the first step is particularly important. Fortunately, as the development of the IT, the CAD was introduced in the land development on the early stages of the apartment construction and the remote control of large construction equipment became available using the computer.

FMS was introduced to the basic facilities of the urban control to manage sewage, dirty water, rain water, underground pipelines in city gas, and heating piping as well as a computer controlled device was applied for electricity, lighting devices.

RFID is consisting of a small mini-computer chip was also introduced for access control and parking control and CCTV was installed here and there to identify road traffic conditions, disaster monitoring, safety and security.

Sensor has been introduced in order to build natural ecological environment and a variety of information such as weather information, it is able to provide graphical clips or characters on terminals installed everywhere. Of course, this information was supplied to each household based home network.

In conclusion, the importance of infrastructure should be particularly emphasized and should be systematically established without duplication or disposal first.

As a minor service or technical problem not covered all in this paper, there are the electromagnetic interference problems when the u-City service provides, the problem of IT standardization and distribution terminal, the problem of reducing the power of the sensor and the installation cost due to the expensive sensor and USN technology to be added to the lack of standardization. All of them take a long time to solve.

D. Standard model and Services as u-Service

Government should ensure service compatibility among u-Cities to develop a service standard model and should focus on prevention of local governments sprawl and redundant investments that might occur while promoting the service model development.

In particular, to prevent the sprawl and redundancy of u-City and to ensure interoperability among the cities, we shall be proliferation and operating after we should be enough to validate of technical and economic feasibility and to develop the standard model.

Therefore, step-by-step propulsion for technology development, technology / service verification through u-City experiment, standardized for minimizing the trial-and-error and promotion of pilot projects and the diffusion of this project is needed in order to enhance the successful u-City project promotion and

investment efficiency.

From the year 2007, u-City Testbed challenges were promoted to minimize trial and error and interoperability between technology and service. And then the technical feasibility of the u-City service model verification and the technical difficulties when applying on-site were derived.

The evaluation of performance on test results was built and standards for u-City service and application were prepared since u-Cheonggyecheon, u-Sejong/Yeongi, u-Haeundae, etc. 6 challenges were successfully terminated.

Meanwhile, in order to build a smooth u-City, IT core technology for infrastructure and u-services should be verified before.

The core technologies to be applied are LTE / WiBro wireless communications in high-speed network, IPv6-based QoS router technology, broadband integrated transport network technology with enhanced security features, RFID tag / reader, NFC middleware technology.

Other technologies are big Data be caused by future mass, unformatted data and 'u-City common standard platform technology' to solve the problem for urban information integration and linkage among cities in terms of how to efficiently store, collect, process and serve the information.

Of these technologies, particularly sensor network technology such as various temperature, humidity, load and acceleration sensors must be adopted in order to gather information of various cities to make the efficient urban management and service delivery.

USN technology field was not mature yet but field-test trials should continue in order to verify the validity of economic, technical and business.

In addition, the introduction of the 'District unit Certification System', the information processing of 2D/3D/indoor and outdoor space and various service models should be developed and revised. Also the civil services are needed to be adequately studied, reflected.

Attributes for the service should be analyzed for u-City service activation and strategy considering of the properties should be established. In the early time, u-City services were divided into 3 sectors, Personal life sector, Industrial economy sectors and Public administration sector.

Since Jeongwoosu et al (2007) defined u-City services as public services and private services to provide criteria for the selection of promising service. Public service is divided into facility management, security / policing / safety, transportation, environment, civil / administrative. Private services is classified as business / commerce, telecommunications / broadcasting / publishing, finance / insurance, logistics, construction, information services, residential, home, health / welfare, education, culture / recreation, tourism.

MLTM announced Notice No. 2009-439 - "Services Classification and Examples of ubiquitous city" in 2009, it contains u-City services are classified 11 fields such as administration, transportation. 68 integrated services, 228 services are followed.

Hwang Sung Jin et al (2011) had proposed to identify group-specific properties and to activate the strategy using publicity, marketability, scalability and connectivity ratings. They had asked 28 professionals who were academia, research institutes, enterprises and municipalities including u-City

Center employees about u-City services were notified by MLTM.

For u-City business to have a self-sufficient, they proposed the 'Strategic Execution Methodology' of u-service to be propelled after the properties of service were determined and considered.

E. Legal System Maintenance, Information Security Platform

For the successful deployment of the u-City, It is also important to raise that it can be u-City model is based on industrialization, internationalization to have a direct elements such as technology, infrastructure, and services, as well as to establish the institutional conditions needed to build the u-City, and to prevent problems that may occur during project goes on in advance.

And then, meantime, u-City projects have been carried out and have been focusing on Vertical Integration such as telecommunications, IT, construction.

From now on, horizontal integration will also be considered such as energy, environment and logistics for a much broader range of structures, systems, and goals.

As previously mentioned, u-City testbed project has been promoted and organized by municipalities. Experiment and demonstration tasks using the project name itself have caused a lot of difficulties of social awareness and institutional aspects in progress.

As an example, waste disposal companies showed reluctance to be concerned about their company's vehicle tracking when performing 'Construction Waste Service' project. The spread of 'Water Management Service' using USN technology could be possible by the law support to the preceding about legal responsibility problem for real-time data

u-City business needs to be applied to a pilot project as a public service nature. Therefore, discount policies of public charges, such as tourism, relic tours, sightseeing are also involved in the business to make a reliable service that can be made in early. It was a good experience to raise awareness about the services and to enable pilot services and to find out more effort in required plan.

In addition to these problems, legal system maintenance has been pushing for u-service standard model formulations, information and communication infrastructure, and relating to the information protection with respect to 'u-City Pilot Project' prepared by the Government.

In u-City, urban management and u-services to provide a variety of information collected, it is urgent to take measures for the protection of information.

For this purpose, "U-City Information Protection Basic Plan" and the roadmap prepared by the government annually for the reliability of the information secured of people, things, all objects as well as to prevent infringement of hacking and viruses with the response system manual when the integration of the City Operation Center was attacked in the ubiquitous environment.

V.CONCLUSION

So far, we suggested policy alternatives and listed the major issues and problems of u-City Korea introduced the background, concept, policy direction and current status for domestic and overseas.

The roadmap of Government including local government have considered its own 'Basic Plan' in accordance with the properly u-City model has conducted to spread out domestic and overseas little by little.

We have not to forget journey for a successful deployment of the u-City is the same as the u-Korea is stacked with all kinds of difficulties. Ways to link existing administrative Legacy System, Information sharing / analysis and cooperation problems related agencies and stakeholder, the economic feasibility of building and standardized measures of a common platform, those challenges are piled up in front of us.

In addition, Homework remains formidable in terms of the social, institutional in non-IT areas. These issues is included u-City construction expenses, Sustainable business model after the u-City construction, u-tourism services, u-City concepts and the digital divide between the u-City and surrounding cities.

In this paper, the following five policy proposals are presented based on the results of these studies.

First, Funding is important to stable development for well-planned municipality nationwide project. Funding approach has been proposed from attracting foreign investment, regional development and national funds. In addition, the procurement plan of operating costs should be presented for the developed u-City spontaneously. Existing cost was spent on crime prevention, policing should be applied naturally as the operating expenses for the new services of the city center.

Second, it is the composition of the ecosystem for u-City industry. The approach should be considered that the Town type u-City is spread by SME, the urban type of u-City is composed by large enterprises. It needs to be applied the Consortium forms to take the individual advantage of role sharing approach. It must ensure the revenues of the u-City by the development and application of a variety of services.

Third, the importance of infrastructure should be particularly emphasized and should be systematically established without duplication or disposal first.

Fourth, the government will need to show the feasibility promoting standardization, actually applied projects to ensure the service compatibility among u-Cities to develop a service standard model. Finally the policy should switch to a civilian-led policy in long-term direction.

Fifth, improving and updating of the law and system. It is to excavate and improve the inhibitory factors that are inconsistent with existing laws and system in advance when combining the city development with new IT.

In 2013, we expect as far as a lot of the problems and issues can be solved when the new government starts. It is fortunate that the new government to adhere to the u-City policies in the current IT policy stance unchanged.

Hopefully, Global IT industry has been towed the national economy during the past 10 years continues to evolve.

And over the next 20 years, the urgent need new industrial development and foundation to feed our economy as the growth of new IT paradigm should be recognized once again.

'U-City' becomes the new national growth engines and

contributes to the improvement of the quality of life of residents is able to the urban space to realize a ubiquitous society. Now, It's time to be solved issues and challenges related u-City to gather strength and wisdom of industry, schools, research institutes and government all.

REFERENCES

- [1] J.H. Koo, "A plan for u-city related of Construction & Traffic", TTA Journal No. 112, TTA, 2007, pp.38-45.
- [2] K.H.Kim, "Busan u-City Project : Seamless Connectivity and Flow without Stopping", TTA Journal 112호, TTA, 2007, p83-89
- [3] E.J.Kim, J.H. Lee, "u-City methodology and middleware", TTA Journal No. 112, TTA, 2007, p55-59
- [4] J.Y. Kim, "A direction of u-City implementation", TTA Journal No. 112, TTA, 2007, p33-37
- [5] H.S. Kim, "Commentary Study on the u-City Model", "2007, 12th Urban Academic Festival : The Status and Perspective of u-ECO City", Hanyang University, LH Corporation, 2007
- [6] "Democratic Elections 4th, 1st Anniversary: International Conference of Perspective for u-City and Future City", Korea Regional Information Society, Korea u-City Association, u-Busan Forum, Busan Metropolitan City, 2007
- [7] "Samsung u-City Conference : New Urban Paradigm for u-City", Samsung u-City Consortium, Samsung Group, 2006
- [8] S.C. Shin, "u-City Standards and Service", TTA Journal No. 112, TTA, 2007, p23-29
- [9] H.J. Yeun, "Invitation to the City of the Future", Future Code : Korea Future Trends, Korea Economy Press, 2008.1, p287-301
- [10] J.I. Oh, "New Millennium Blue Ocean, u-City : Oversea Trends, Vision, Activating Strategy", 2005, Housing Urban
- [11] J.Y. Oh, "u-Service Current Status and Challenges of Citizens", Ubiquitous Social Studies Series No.4, NCA, 2005
- [12] B.C. Lee, Y.J. Lee, "u-City Business Model and u-Service", TTA Journal 112호, TTA, 2007, p72-82
- [13] K.K. Lim, J.S. Kim, "u-City Operation Center and Platform as u-City Infrastructure", TTA Journal No. 112, TTA, 2007, p60-66
- [14] Y.O. Chon, J.E. Yoon, "Successful development Models and Implications of u-City", SERI, 2006
- [15] H.I. Jeon, "u-City Core Technology for Public/Private Service", TTA Journal No. 112, TTA, 2007, p46-54
- [16] "NIA, u-City Implementation Activation Plan", MIC, 2007
- [17] B.M. Jeong, "u-City Testbed Status and Perspective of Standard", TTA Journal 112호, TTA, 2007, p67-71
- [18] "2006 u-City International Conference", NIA, Korea u-City Forum, MIC, 2006
- [19] "Legal Issues and Problems of u-Service", NIA, 2006
- [20] "Technology and Application of Sensor Network to build the u-City: 2007 Spring Seminar", Society of Information and Communication Equipment, 2007
- [21] "2007, u-City Forum Subcommittee Workshop", u-City Forum, Korea u-City Association, 2007
- [22] "A rendezvous with ubiquitous and city : u-City", NIPA S/W Industry Trends, NIPA, 2008.6.16
- [23] B.S.Cho, W.S.Jeong, H.S.Cho, "A Study on the Business and Trend of u-City", ETRI Journal No.21-4, ETRI, 2006.8
- [24] "A Guideline for IT Infrastructure Implementation of u-City V2.0", NIA, 2009.11
- [25] S.J.Hwang et al, "A Study on Service Activation Plan of u-City", Green Growth Research Series in 2010, KISDI, 2010.12.



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